MULTIMEDIA UNIVERSITY

STUDENT ID

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FINAL EXAMINATION

TRIMESTER 1, 2019/2020

TIS1101 – Database Fundamentals

(All sections / Groups)

21 OCTOBER 2019
9.00 a.m - 11.00 a.m
(2 Hours)

INSTRUCTIONS TO STUDENTS

1. This question paper consists of 5 pages, including the cover page, with FOUR questions only.

2. Attempt **ALL** questions. All questions carry equal marks and the distribution of the marks for each question is given.

3. Please write all your answers in the answer booklet provided.

Answer ALL Questions

QUESTION 1

Draw a complete entity-relationship diagram (ER-D) using Crow's Foot notation based on the following business rules:

- A performer participates at most 3 concerts. A performer is identified uniquely using performerID.
- A concert may be participated by several performers and is identified uniquely using concertID.
- A concert uses at least 2 musical instruments. Each instrument may be used in a concert and is identified uniquely using instrumentID.
- A performer is either goldstar, superstar or having both goldstar and superstar status at the same time.
- An instrument may be categorised into one of three categories: (1) piano, (2) guitar and (3) drum. These instruments are distinguished by instrument type.

The primary key and foreign key (if any) must be included for every entity, other attributes are optional. The cardinality, connectivity and relationship strength in your ER diagram must be denoted accordingly.

[10 marks]

Continued .....

QUESTION 2

Answer questions (a) to (d) based on the following relational schema about FLIGHT. The primary key for each relation is underlined and foreign key is in bold.

FLIGHT (FlightID, AirlineName, Departure, Arrival)

FLIGHTINFO (FlightInfoID, **FlightID**, DepartureDate)

BOOKING (BookingID, **CustomerID**, **FlightInfoID**, Status)

CUSTOMER (CustomerID, CustomerName)

(a) Assume that CUSTOMER and FLIGHTINFO tables have been created. Write a query to create the BOOKING table. Sample data stored in BOOKING table are as below. You may assume any suitable data types for the attributes in the table.

BookingID	CustomerID	FlightInfoID	Status
B1	C2	F100	Pending
B2	C1	F101	Pending
B3	C3	F100	Pending
B4	C2	F102	Confirmed
B5	C3	F102	Pending
B6	C2	F103	Pending

[2.5 marks]

(b) Write a query to list the names of airlines that have flight which will depart from 'Malaysia' to 'Australia' in December 2019. The results of your SQL should remove duplicates of airline name, i.e., only show the unique airline name.

[2.5 marks]

(c) Write a query to calculate the total number of flights to 'Japan' for each airline. The results of your SQL should only list the names of airlines that have more than 10 flights.

[2.5 marks]

(d)

i. Write a query to create a trigger that will automatically set the booking status to 'Confirmed' for all the rows. The trigger will be invoked each time a new row is inserted into the BOOKING table.

ii. Write a query to invoke the trigger created in Question 2(d)(i).

[2+0.5 marks]

Continued .....

QUESTION 3

Answer questions (a) – (c) based on the following relation:

RoomID	RoomType	RoomPrice	BookingID	StartDate	Duration	CustomerID	CustomerName

(a) Draw the dependency diagram in 1NF for the above relation. Show all the dependencies and underline the primary key(s).

[4 marks]

(b) Based on your solution in Question 3(a), normalize the dependency diagram to 2NF. Draw the resulting dependency diagram and underline the primary key(s).

[3 marks]

(c) Based on your solution in Question 3(b), normalize the dependency diagram to 3NF. Draw the resulting dependency diagram and underline the primary key(s).

[3 marks]

Continued .....

QUESTION 4

(a) Discuss the difference between an operational database and a data warehouse in terms of the following characteristics:

i. integrated
ii. subject-oriented
iii. time-variant
iv. non-volatile

[4 marks]

(b) What are the FOUR activities that need to be carried out in the database initial study phase?

[2 marks]

(c) List any TWO advantages of cloud services.

[2 marks]

(d) What is the difference between public cloud and private cloud?

[2 marks]

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